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December 29, 1951

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TECHNOLOGY DEPT.

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

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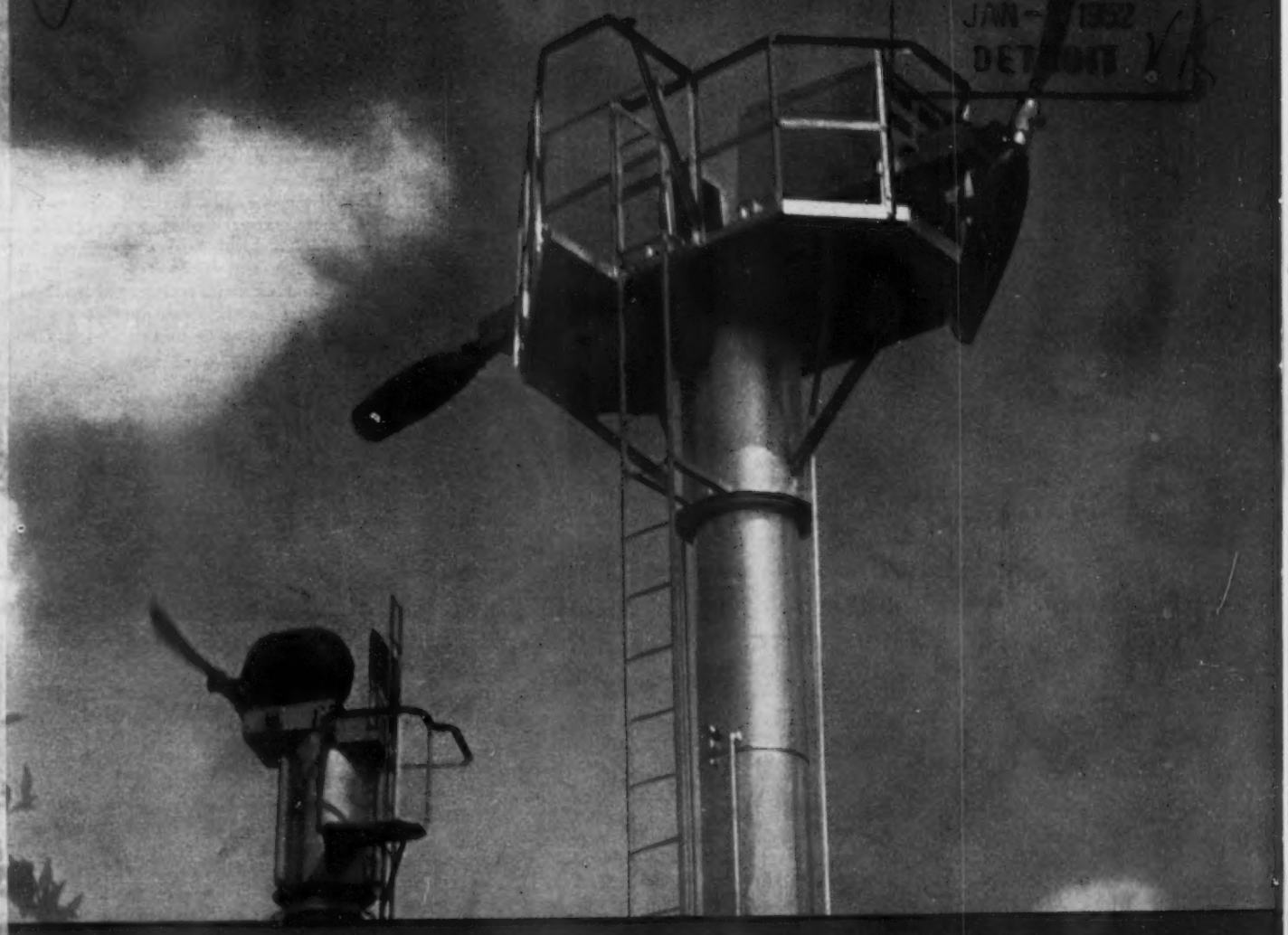

Frost Killer

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VOL. 60 NO. 26 PAGES 401-412

MEDICINE

Reverse Nerve Disease

Disabling symptoms of degenerative disease of brain and liver reversed by treatment with BAL, the British antilewisite war gas chemical.

➤ A DEGENERATIVE disease of the brain and liver, disabling and hitherto considered incurable, can now be controlled and the disabling symptoms reversed by BAL, the British antilewisite war gas chemical.

The disease is known as hepatolenticular degeneration, or Wilson's disease. It tends to run in families. Good results with BAL treatment in five cases of this "uncommon but not rare" disease are reported by Drs. D. Denny-Brown and Huntington Porter of Boston.

Hope for ultimate conquest of all such degenerative nervous diseases is now offered, the doctors state, through solution of the problem of this one. BAL may not be the remedy for other nervous disorders, such as multiple sclerosis. But all of them may have the same kind of cause. There may, in all of them, be an inborn mistake in the body's handling of chemicals from foods. By-products of such mistakes may pile up on the nervous system in such a way as to cause it to break down at one or more points.

That seems to be what happens in the case of Wilson's disease. Copper compounds accumulate abnormally in the liver and brain. This causes the symptoms which make the patients bed-ridden, unable to walk or stand alone, unable to feed themselves, sometimes unable to turn in bed. It also causes the bronze coloring of the skin in some of these patients, and the smoky-brown color of the usually gray corneal ring in the eyes.

BAL mobilizes the copper that has been deposited abnormally in body tissues and causes increased excretion of it. The idea of using BAL for treatment of Wilson's disease came partly from knowledge that it could remove other metals, such as gold and mercury, from the body.

BAL is given by injection deep into the muscles twice a day for 10 days every second month. Improvement of symptoms does not start until 14 days after the first course of injections. The improvement lasts only two to three months, which is why the doctors settled on repeating the course of BAL injections every second month.

Drs. Denny-Brown and Porter made public their success in a report to the Massachusetts Medical Society's NEW ENGLAND JOURNAL OF MEDICINE.

Science News Letter, December 29, 1951

METEOROLOGY

Aluminum Output Saved

Pinpoint predictions of amounts of rain, much greater than normal, that would fall in Pacific Northwest helped to save area's defense contracts.

➤ PINPOINT PREDICTIONS, which came true, of a month's rainfall in the Pacific Northwest helped save that area's defense contracts for aluminum last October.

The predictions called for, by amounts, much greater than normal rain during October. They were made by the Weather Bureau's Extended Forecast Section and sent by Secretary of Commerce Sawyer to Defense Mobilizer Charles E. Wilson.

Ordinarily, forecasts for a month ahead are couched in somewhat vague terms and cover large areas. But these specified the number of inches of rain to be expected at seven weather stations in Oregon and Washington. For instance, at Seattle, normal rainfall for October is 2.69 inches. The weathermen predicted four to seven inches and 4.71 inches actually fell. At Portland, 2.85 inches is normal for October; five to eight inches was predicted for that city during the month and 6.9 inches actually fell in the prescribed time.

The rain cut short attempts to make rain artificially under a contract between the Department of the Interior and Dr. Irving Krick's Water Resources Development Corp. He seeded clouds with silver iodide for only ten days in late September and early October. His results are being evaluated by the Interior Department in cooperation with the Weather Bureau.

Jerome Namias, chief of the bureau's extended forecast section, emphasized that he can very rarely turn a trick like this. Exceptional circumstances, he said, made the predictions possible. These included a cyclonic movement in the Gulf of Alaska, many cold fronts moving in and unstable polar Pacific air masses.

Other predictions included: Boise, Idaho, 1.15, normal; 1.5 to two predicted, and 1.60 observed. Burns, Ore., 0.66 normal; one to 1.5 predicted, and 1.71 observed. Roseburg, Ore., 2.41, normal; four to seven inches predicted, and 5.38 observed. Spokane, Wash., 1.06 normal; two to four inches predicted, and 3.26 observed. Tatoosh Island, Wash., 8.11 normal; ten to 14 predicted, and 9.49 observed.

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PALEONTOLOGY

Find Fossil Remains of Long Extinct Sharks

➤ FOSSIL REMAINS of two kinds of long-extinct sharks, previously known only from the rocks of France and North Africa, have now been found on this side of the Atlantic.

The long-snouted, predatory sea creatures are believed to be roughly like present-day sawfishes. They swam in seas as long as 100,000,000 years ago, about the time the huge dinosaurs were going into decline and mammals were bidding for supremacy on land.

What apparently were the spines of one of these extinct fishes were obtained by U. S. Geological Survey explorers Joseph H. Sinclair and Theron Wasson in Ecuador. Another kind, represented by the teeth of its "saw," came from the Georgia Kaolin Company and was found in Twiggs County, Ga.

The fossil remains have been added to the Smithsonian Institution's collections. They are significant, Institution scientists say, because they show the wide distribution of these fishlike creatures. Present-day sharks retain many of the oldest structural characters of this species.

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RADIO

Short-Wave Radio Reception Disturbed One Third of Year

➤ STORMY WEATHER has dogged short-wave radio reception throughout the past year. On 124 days foreign broadcasts have been disturbed by weak signals and fading, frequently accompanied by blackouts.

A total of 53% of the storms in the ionosphere, which resulted in bad reception of short-wave broadcasts, were predicted. Likewise 53% of the storms predicted actually materialized, radio forecasters at the National Bureau of Standards in Washington stated.

Of all of the Bureau's twice-a-week forecasts of good or bad reception, 68% were correct. The more frequently reception is disrupted, the more difficult predicting becomes, the forecasters point out. Not only must a storm be predicted but radio users should be warned in advance as to the exact day on which it will arrive.

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GENETICS

1,000 Mutations of Corn

Over 1,000 radiation-induced mutations of corn found in special study. Some of these freaks of the plant world are descendants of A-bomb irradiated seeds.

➤ MORE THAN 1,000 radiation-induced mutations of corn have been found by California Institute of Technology biologists in a special study at their Biology Experimental Farm in Arcadia.

Some of these freaks of the plant world, among them dwarf, twisted, frail and blue-fluorescent varieties, were grown from descendants of A-bomb irradiated seeds. Others sprang from seeds subjected to large doses of X-rays and other types of radiation.

The mutations are being used to study heredity and transmitted traits. The plants also provide a direct method of determining radiation effects on food crops and other flora and perhaps indirectly on human beings. Measuring the biological effects offers an indirect method of determining the amount of radiant energy involved in an A-bomb explosion.

Correlations have been established between biological effects and the measurements made with such instruments as the Geiger and scintillation counters, permitting one method to be used as a check on the other in some cases.

The Caltech work in radiation genetics is supported by the Atomic Energy Commission through the Office of Naval Research. Dr. Ernest G. Anderson, professor of genetics, is in charge of the farm. His colleagues in the program include Drs. Albert E. Longley, E. E. Dale and Howard J. Teas.

Hundreds of mutations were found by the scientists in progeny of seeds exposed in the Bikini "Able" bomb test in 1946 and more than a thousand in descendants of seeds irradiated in the Eniwetok test of 1948, Dr. Anderson reports. So many were discovered that only the more interesting variations are being studied intensively, he said.

The seeds exposed at Bikini, however, were commercial varieties in which many mutants might have occurred naturally. Careful analysis and selection reduced the number of mutations positively identified as radiation-induced in the Bikini "crop" to 60.

This sifting was not necessary in the Eniwetok "crop," for all the seeds exposed there were supplied by Dr. Anderson from stocks at the Farm known to be free of mutations and to have constant characteristics throughout.

The principal effect in the mutants as a group, in 46 of the 60 positively identified Bikini mutations, for example, was noted on chlorophyll, the green coloring matter of the plant which uses sunlight to convert air and water into food. Many of these mutants showed a mottling or mosaic of normal green with abnormally pale green, yellow or colorless areas. Some were albinos.

The remainder, Dr. Anderson states, run the gamut of known mutations and added many more. "Virtually everything described previously as a mutation has been picked up in the bomb-exposed material," he said.

Variants included dwarfed and grasslike corn, plants with elongated stems, plants without silks or kernels, others with twisted and contorted leaves and no ears, delicate plants which wither in the noonday sun and still others differing from normal only in that they glow an eerie blue under ultraviolet light.

In one rather extreme type the seeds germinate prematurely on the ears. Ordinarily, a seed forms on an ear, matures, dries and germinates when it is planted in soil. But in some mutants one in four seeds is abnormal, germinates on the ear and 100 or more little corn plants may grow directly from the ear.

The variants are produced by the mixture of many types of radiations, gamma, neutron, alpha-particle, etc., from atomic explosions which damaged or changed the trait-carrying elements of the corn's reproductive system.

Heredity is carried out in sexually reproducing plants and animals by the chromosomes. These fine threads of nucleoprotein can be seen with a microscope in the nuclei of dividing cells. They are made up of many thousands of submicroscopic units called genes, whose action controls the development of inherited characteristics.

Each cell of a plant or animal contains both chromosomes and genes in pairs. They come from the parent plant or animal—one of the pair coming through the sperm and the other through the egg. Such a changed characteristic is inherited when mutation occurs.

One Bikini sample, he said, showed an effect about equal to that produced by 15,000 r-units (roentgen units, a measure of dosage) of X-radiation. (According to the AEC publication, *The Effects of Atomic Weapons:* ". . . Published estimates of the dose that might be expected to double the (normal) gene mutation rate in man range from as low as 3 r to as high as 300 r and it is conceivable that the true value lies outside these limits.")

Later tests involving Eniwetok bomb radiation, gamma rays and X-rays have given data in fair agreement with the Bikini test, according to Dr. Anderson.

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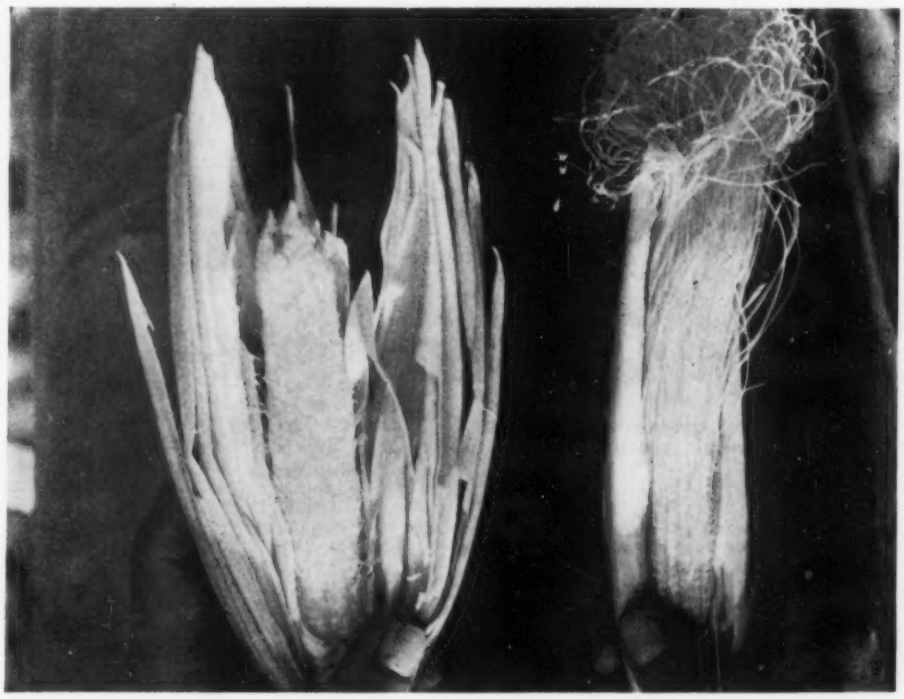

MUTATED CORN—The normal ear of the corn on the left contrasts sharply with an Eniwetok mutant which produces no kernels or silk shown on the right. This freak plant is a descendant of corn exposed to unspecified amounts of radiation during the Pacific A-bomb tests.

BIOLOGY

Registry for Antibiotics

➤ SO MANY mold remedies have been discovered and so many more are currently being reported that an international registry of them is now needed, in the opinion of Dr. Kenneth B. Raper, principal microbiologist of the U. S. Department of Agriculture's Northern Regional Research Laboratory, Peoria, Ill.

Antibiotics is the better name for these chemicals. Some of them, such as penicillin, come from molds but others, such as bacitracin and subtilin, come from bacteria.

More than 300 antibiotics have been reported in the past 10 years since the big push to produce penicillin started, Dr. Raper stated in his presidential address before the Mycological Society of America.

"Of these, only five," Dr. Raper pointed out, "have attained the stature of major drugs, namely: penicillin, streptomycin, chloramphenicol (chloromycetin), aureomycin and terramycin.

"A few others find limited applications and today remain on the threshold as potentially important drugs, namely: tyrothricin, polymyxin, bacitracin, subtilin, neomycin, thiolutin and possibly viomycin."

All the others, for one reason or another, are considered unpromising for use as remedies. Some are not potent enough. Many are too toxic, or poisonous, for use in animals and man.

While the percentage, five out of 300, is very low, the occasional "strike" more than makes up for all the disappointments, Dr. Raper pointed out. The hope of such a "strike" keeps scientists and pharmaceutical research laboratories working on, trying to discover another, possibly better antibiotic, or one that stops diseases for which there still is no remedy. Virus diseases such as influenza and poliomyelitis are examples of those for which antibiotics are sought.

This intense search, however, has resulted in the reporting of more and more antibiotic substances. Sometimes the new ones turn out to be duplicates of others previously reported. Sometimes the person reporting a new antibiotic does not give it a name and does not identify by name the mold or bacteria or other organism from which it comes.

A national, or better still an international, registry of antibiotics and the organisms which produce them would go far, in Dr. Raper's opinion, toward clearing up some of the confusion and preventing much duplication of scientific effort in this field.

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TECHNOLOGY

Air Agitation in Oil Tanks Helps to Extinguish Fires

➤ ORDINARY AIR is the newest aid in controlling fires in oil tanks. This air is forced into the bottom of the tank and, rising to the surface, causes agitation of the contents which brings cold oil from lower layers to the burning surface to decrease vapors feeding combustion.

The ordinary foams used in fire-fighting do the rest of the job. The job is easy because there is no slop-over, frothing and expansion of the hot oil layer at the top that there would be without the application of air and the agitation produced. In one test a tank holding blazing crude oil was under control in 45 seconds and completely extinguished in five minutes by firemen applying foam at close range.

One of the practical aspects of the plan is that no intricate or costly equipment is needed. The air is pumped into the tanks through the pipes that are already there, installed to draw off water that has collected or to draw off oil. Readily available air and a pump capable of producing about six pounds of pressure will do the job.

This process was developed by J. L. Risinger of the Socony-Vacuum Oil Company. It has been successfully used in a tank of 100,000 gallons of flaming kerosene, extinguishing the fire in five seconds. The method has been applied only to oil tanks so far but it is expected to be equally effective for tankers at sea.

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CHEMISTRY

Photo Film Base Changing

Revolution in kind of material used for transparent base of photographic film expected from trials with polyester chemical related to Dacron.

➤ A REVOLUTION in the kind of material that is used for the transparent base of photographic film is on the way.

One of the newest plastics, a polyester chemical, is the film base of the future. It is related to the newest of synthetic textile fibers, Dacron, as it is now called after an early stage when it was known as Fiber V. Thus the same chemical material will be used in the future for men's shirts and ladies' underthings as well as film.

Very limited quantities of the new polyester film base are being produced at Du Pont's photographic film factory at Parlin, N. J. These are being sent to the motion picture industry and the armed forces for extensive trials.

The new film is likely eventually to outmode both the older cellulose nitrate and the newer cellulose acetate safety film. But now production is limited to experimental quantities.

The polyester film has better or equal transparency than nitrate. It is dimensionally stable to a greater extent. Air Force experiments are reported to find that the polyester film keeps its proper dimensions at as low as 20 degrees below zero, making it suitable for arctic use in reconnaissance photographs. First practical use is likely to be in this field. Keeping exact dimensions is also very important in film used for lithographic and other printing negatives.

The new film is also tougher than either nitrate or acetate, which is important in withstanding the wear of motion picture projection. It is less flammable than even the acetate.

Nitrate film, despite the fire and explosion risk, has been long used in commercial motion pictures because it produces better quality images than the safety acetate film standard for all 16 mm. home and amateur movies.

A cellulose triacetate film, now in production by Eastman, has begun to supplant the nitrate film in commercial movie use. The triacetate, made by carrying out the acetylization a little farther, has better qualities than the monoacetate or the diacetate which compose the usual safety film.

The polyester plastic or resin, of which both Dacron and the new film base are made, is a different kind of chemical. It is made by polymerizing ethylene glycol (used in permanent type antifreeze) and dimethylterephthalate.

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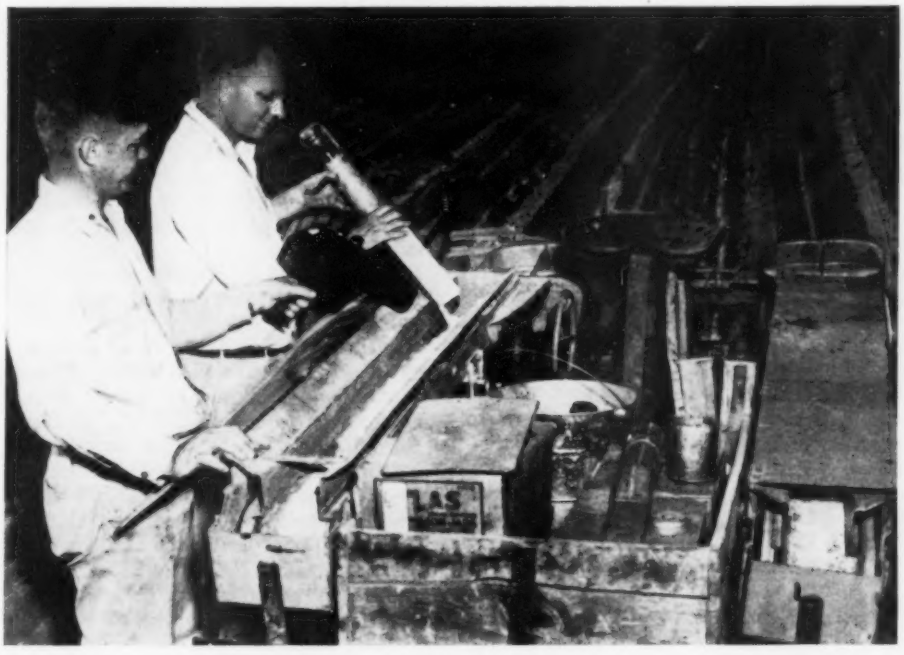

FERTILIZER USE—The best way to place fertilizer is being learned through studies such as this, where radioactively tagged fertilizer, loaded on an endless belt of hoppers, is distributed to a field. One scientist is checking the radioactivity hazard as the "hot" material is poured out through the metal tube.

MEDICINE

Blood Difference in Sclerosis Clue to Cause

➤ SIGNIFICANT CHEMICAL differences in blood and in kidney secretions of multiple sclerosis patients from normal patients have been discovered by Dr. Harold H. Jones, director of the H. L. Snyder Memorial Research Foundation at Winfield, Kans.

Blood of multiple sclerosis patients also clots more slowly in most cases, Dr. Jones found. These patients have more cholesterol in their blood serum but the fatty phosphorus compounds in the blood serum are not proportionately increased.

These studies, designed to learn more about the nerve crippling disease in the hope of finding how to stop it, were reported by Dr. Jones at the meeting in New York of the medical advisory board of the National Multiple Sclerosis Society which has supported the work since last April.

The effects of ACTH, famous anti-arthritis hormone, in multiple sclerosis, are being studied by Dr. Jones and other scientists under grants from the society.

But the studies have only just started and no results have yet been obtained.

Search for a possible virus cause of the disease has now also started, but so far none has been found.

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AGRICULTURE

Exploding Phosphorus Atoms Tell Where to Put Fertilizer

➤ EXPLODING ATOMS of phosphorus are helping scientists to know just where to place fertilizer so that crops can get the most out of it.

Scientists from the U. S. Department of Agriculture and State Experiment Stations gathered at Beltsville, Md., to report on the use of radiophosphorus and other similar atomic-reactor manufactured isotopes (atomic varieties) in fertilizer studies.

Instead of spreading the fertilizers broadcast over the fields and gardens, agriculturists learned some years ago to place the added plant food closer to the seeds and roots in rows and small patches.

Radiophosphorus, which by its radioactivity can be traced in the plants, is now telling what methods of application are most efficient, Dr. R. Q. Parks, head of the U. S. Department of Agriculture soil management and irrigation division, explained in opening the conference. It is possible to trace how much of the plant's phosphorus comes from the soil and how much from the fertilizer.

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GENERAL SCIENCE

Tax Bite on Fellowships

Internal Revenue Bureau may take away long-standing tax exemptions of millions of dollars in fellowships. One man working full time on problem.

➤ THE INTERNAL Revenue Bureau is planning to take away the long-standing tax exemption of millions of dollars in fellowship gifts given each year by foundations and large corporations to increase basic scientific and cultural knowledge.

One man has been assigned by the Bureau to work full time on fellowships. It is believed that they will be judged by two rulings. The first declared that all fellowships for research or study after the doctorate degree were to be considered as income and therefore taxable.

The second, made last summer, upset precedents of 27 years in the tax-exempt status of the well-known John Simon Guggenheim Memorial fellowships. This ruling was made as the result of an appeal from the first ruling by the Guggenheim Foundation. Now, all of the $750,000 a year given to scientists, artists and writers as gifts by this foundation is taxable as income.

The ruling means that the government stands to gain more income, but it also means that the multi-million dollar fellowship programs in the country will be jeopardized. It upsets years of precedent during which such fellowships were looked upon as gifts by the Internal Revenue Bureau and, therefore, tax free.

Taxable as income under the new ruling was an assistant professor of physical chemistry who received $3,000 for a nine-month period of research in the field of structural chemistry. Also taxable was the $3,500 a writer received to finish a novel, the $3,500 a scientist received to study the physiology and biochemistry of aquatic fungi, and the $3,500 given for research into the relations between government and economic processes.

It is believed that the new ruling was the result of investigations which showed that some universities and corporations were taking advantage of the tax-free status of fellowships. There was one case where a corporation was paying a scientist $8,000 a year to do a specific job, from which the corporation benefitted. The corporation called it a "fellowship."

The new ruling contrasts with the practices of Canada and many other nations, in which such gifts as the Guggenheim fellowships are tax free.

The Internal Revenue Bureau will, a spokesman said, decide cases on an individual basis. However, if the Guggenheim ruling is any criterion, fellowship gifts from the Rockefeller Foundation, the Atomic Energy Commission, the National Research Council, the new National Science Foundation, E. I. du Pont de Nemours & Co. and other large organizations stand in almost certain danger of being taxed as income.

A sort of prelude to this ruling was an early ruling by the Bureau that Fulbright scholarships would be taxable as income. However, it is understood that the State Department persuaded the Treasury Department to reverse this ruling.

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ENTOMOLOGY

Sterile Mates Eradicate

➤ FOOLING FEMALES with sterile mates is a revolutionary method of insect eradication about to be field tested by the U. S. Department of Agriculture.

The insect to be eradicated is the screw-worm fly which produces maggots that infest cattle in Florida and nearby states. X-ray treatment will cause the pest's sterile condition.

The males to be sterilized will be laboratory-raised and treated. They will be distributed by airplane in the area where the screw-worm is found. They will mate with the females but the eggs produced by the female will not hatch. This has been proven by laboratory tests. The female fly mates only once, and, if mated with one of the sterilized males, none of the 300 eggs she lays in her lifetime will hatch.

Cage tests indicate that when there are five to ten times as many radiated as normal males in a mating area, eggs from most females are infertile. In southeastern states, winter weather usually causes the death of most of the screw-worm flies but some overwinter in central and southern Florida. It is in these hard-hit areas where the proposed field tests with sterile males will be made.

In nature the screw-worm develops only in the living flesh of animals, but federal entomologists have found a way to mass produce them in the laboratory. The proposed plan involves the production of millions of them each week, irradiating them on their sixth pupal day and distributing the flies, when hatched, over infested areas by airplane.

Present irradiation is with the X-ray, but arrangements have been made with the Atomic Energy Commission for tests of atomic radiations as sources of sterilizing rays which might prove equally effective and less expensive. Later testing will use the cathode ray. The expectation is that this distribution of sterile males will have to be continued over a two-year period to result in screw-worm fly eradication.

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METEOROLOGY

Wyoming Holds Record For Coldest Weather

➤ SO YOU think it's cold these days?

Well, on Feb. 9, 1933, at Riverside Ranger Station, Wyo., the temperature hit minus 66 degrees Fahrenheit, the coldest it has ever been in the United States.

As a matter of fact, the thermometer has hit minus 60 or below only ten times since such records have been kept. Montana originally held the record—four times at places in Montana between 1885 and 1905 the temperature has gone down to minus 60 or less. Since then Montana has given way to Wyoming, Idaho, North Dakota and Colorado.

Latest drop to minus 60 occurred last winter, Feb. 1, 1951, at Taylor Park, Colo. A compilation of these low temperatures appears in WEATHERWISE (Dec.)

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PUBLIC HEALTH

Change Rules for Importing Parrots

➤ A PARROT, love bird or parakeet may now be brought into this country as a pet after its owner has had the bird abroad only four months instead of the two years previously required by Federal quarantine restrictions.

Changes in the regulations on importing the voluble birds from abroad were effective Dec. 15.

The new regulations apply to all members of the psittacine bird family, known as carriers of psittacosis, or "parrot fever," an acute respiratory disease that is easily transmitted to humans. They include parrots, Amazons, Mexican double heads, parakeets, African grays, cockatoos, love birds, lories and lorikeets. Recent studies have shown that psittacosis is found among birds other than members of the psittacine family.

Other quarantine regulation changes remove the eight-month minimum age limit on birds imported for use by zoos and research institutions. Added to the requirements is the signing of an affidavit that the birds are being imported as pets, are not to be resold and that no other birds have been brought into the country as pets by the owner in the preceding year.

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ASTRONOMY

Jupiter Joins Winter Stars

Planet added attraction in January's usually brilliant display of bright stars. Approach of Mars and total eclipse of sun among astronomical events for 1952.

By JAMES STOKLEY

➤ THE NORMALLY brilliant display of bright stars, which January evenings always bring to our southern skies, is augmented this month by the planet Jupiter in the southwest.

Of magnitude minus 1.9, Jupiter is about a third brighter than Sirius, the most brilliant star. This shines in the southeast, in the constellation of Canis Major, the great dog.

Above and to the right of Sirius we find Orion, the warrior, its position depicted on the accompanying maps. These represent the appearance of the skies at about 10:00 p.m. your own kind of standard time at the first of January, an hour earlier on the 15th and two hours earlier on the 31st.

Orion can easily be recognized by the three stars in a row that form the warrior's belt, even though these are not the brightest stars in the constellation. Above the belt is Betelgeuse and below it is Rigel, both of which are of the first magnitude.

Still higher than Orion and a little farther to the right is Taurus, the bull, in which stands brilliant Aldebaran, marking the eye of the beast.

Above and to the left of Sirius is the lesser dog, Canis Minor, in which there is another bright star called Procyon. And still higher and farther left are the twins, with Castor and Pollux, the latter of the first magnitude. Climbing still higher we find directly overhead Auriga, the charioteer, containing the brilliant Capella.

Few First Magnitude Stars

Aside from those in and around Orion, only two other first magnitude stars are visible these January evenings and both are so low that they are considerably dimmed by the great thickness of earth's atmosphere their light has to penetrate.

Low in the northwest, as indicated on the maps, the very top of Cygnus, the swan, is visible, the rest having passed below the horizon. The top star is Deneb, which in this position looks about fourth magnitude. The other first-magnitude star is shown directly east—Regulus, in the constellation of Leo, the lion. During the evenings of late winter and spring this will climb into better view in the south.

Glancing ahead for the year 1952 we find an approach of the planet Mars and a total eclipse of the sun among the chief events on the astronomical program. The eclipse, unfortunately, will not be visible in the United States and political unrest seems likely to interfere with its observation along the path where it will be visible.

This goes across Africa, Arabia, Iran and Siberia. The Siberian part of the world has naturally been out of consideration for an observing site by astronomers of the west. Iran seemed a possibility, but the anti-British agitation there has made that country generally unavailable also. Saudi Arabia is hard to enter, but the Anglo-Egyptian Sudan, around Khartoum, attracted the attention of interested astronomers, particularly since it was not far from the part of the path where the eclipse will last longest. But now the troubles in Egypt make the Sudan less hopeful.

Farther to the southwest, the path goes through the jungles of equatorial Africa, hardly a suitable location for eclipse observations, so perhaps observations of this eclipse will be considerably more curtailed than was expected a year or so ago.

Four Eclipses Scheduled

Actually, the Feb. 25 eclipse is one of four of 1952—two of the sun and two of the moon. The second solar eclipse, likewise invisible in the United States, comes on Aug. 20. This is an annular eclipse, where the moon does not completely cover the sun's disk but leaves a bright ring visible, even where the eclipse is at its greatest. This ring will be seen in South America. Over a large area, including Central and South America, there will be a partial eclipse, with one edge of the solar disk being hidden by the moon.

Of the two moon eclipses, the first, on Feb. 10, will be visible in the United States and Canada. This, however, is a small partial eclipse, with less than a tenth of the diameter of the moon's disk being covered by the shadow of the earth. The second moon eclipse, on Aug. 5, also partial, will not be seen at all in North America.

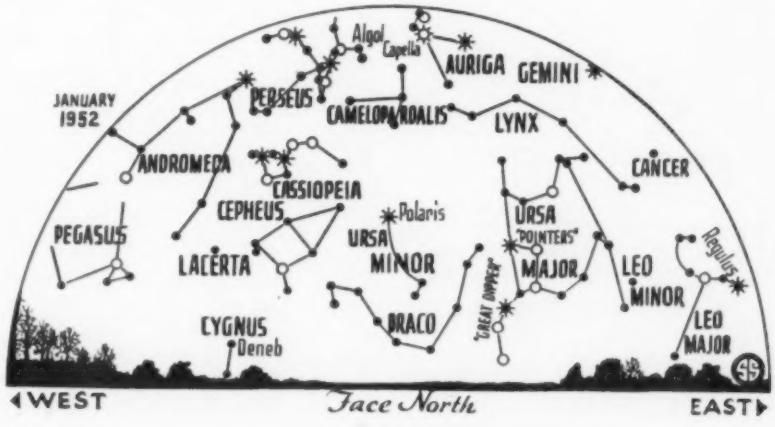
Every two years and two months, approximately, Mars is at opposition, directly opposite to the sun as seen from earth and then it is nearest to us for that particular Martian revolution. However, the orbit of Mars is so much farther from a true circle than is the orbit of the earth that the distance of Mars at opposition varies from as little as 34,500,000 miles to a maximum of 62,900,000 miles.

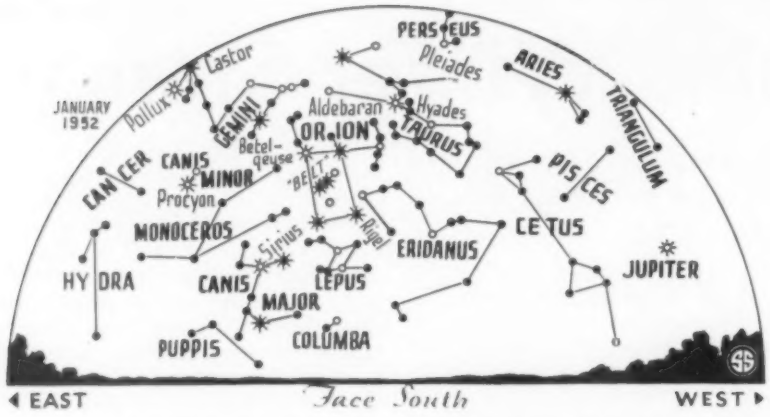
Mars Closer in 1956

A close one occurs every 15 or 17 years, the last having happened in 1939. In recent years the oppositions have been unfavorable ones, but now the planet is working towards us. When opposition occurs in 1952 on May 8, it will be 51,925,000 miles away. This is fairly good though not as favorable as in 1954, when it will come within 40,300,000 miles, or in 1956 when it makes the remarkably close approach of 35,400,000 miles.

In January Mars rises about midnight or a little after. By the end of April it will rise at sunset and for the rest of the year it will be visible in the evening sky. Jupiter, which is now so prominent in the evening, will disappear completely around the middle of April, when in line with the sun. By May it will be a morning star, visible in the east before sunrise. By next autumn, as now, it will become visible in the evening sky.

Saturn is now almost opposite to Jupiter, so it will play an opposite role. This month Saturn rises about midnight, soon after Jupiter sets. By April Saturn will be seen throughout the evening and will continue to be visible until late summer. Last year the rings of Saturn were on edge as seen





from the earth, and hence for part of the time were practically invisible, even through a telescope. Now they are opening up again and the planet will become a most interesting object for observatory visitors to view.

Venus, which also is now a morning star rising about three hours ahead of the sun and shining more brilliantly than any other star or planet, will disappear behind the sun by late spring. By the beginning of autumn, it will become visible in the early evening. From then on its visibility will improve until it becomes a very prominent object in the evening in the spring of 1953.

Though Mercury will swing to the east of the sun, and remain above the western horizon for a while after sunset on three occasions in 1952, it is when this happens on March 18 that one will have the best opportunity of seeing this elusive little planet. For a few days before and after that date it should be easy to locate in the west as twilight is falling. Around Dec. 18, 1952, will be the best time for seeing it in the eastern sky, just before sunrise. However, it will similarly be a morning star early in January, for it will also be farthest west of the sun on the sixth.

Celestial Time Table for January

Jan.	EST	
2	9:57 p.m.	Algol (variable star in Perseus) at minimum brightness
3	3:15 p.m.	Moon passes Jupiter
	11:42 p.m.	Moon at first quarter
4	4:00 p.m.	Earth nearest sun, distance 91,449,500 miles
5	6:46 p.m.	Algol at minimum
6	3:00 p.m.	Mercury farthest west of sun
11	11:55 p.m.	Full moon
12	1:00 a.m.	Moon farthest, distance 252,500 miles
19	3:48 a.m.	Moon passes Saturn
20	1:09 a.m.	Moon in last quarter
	7:29 a.m.	Moon passes Mars
23	11:41 p.m.	Algol at minimum
24	2:24 a.m.	Moon passes Venus
26	7:00 a.m.	Moon nearest, distance 227,100 miles
	5:26 p.m.	New moon
	8:30 p.m.	Algol at minimum
31	6:54 a.m.	Moon passes Jupiter

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, December 29, 1951

METEOROLOGY

Jet Stream Brought Storms

➤ A 150 TO 200 miles-an-hour jet stream of wind 30,000 to 40,000 feet up over the United States and a "wrong way" ridge moving westward out over the Pacific 10,000 to 20,000 feet up were responsible for the recent series of winter storms.

This is the opinion of Jerome Namias, the Weather Bureau's extended forecast expert. The "wrong way" ridge was a south-pointing indentation in the broad current of air which circles the northern hemisphere 10,000 to 40,000 feet up, traveling from west to east. Only this ridge had been traveling westward, in the opposite direction.

It was first responsible for the movement of warm moist air from the Gulf of Mexico up to the mid-western United States. Then it moved out over the Pacific, where the warm moist air over that ocean was moving northward. In both instances cold Arctic air moved down the ridge to meet the warm moist air, thus setting up the conditions for the storms and snow.

The pattern of alternating cold waves and snowstorms across the country was a by-product of both the jet stream and the ridge, according to Mr. Namias. It is his theory that jet streams are formed through the meeting of warm air from the south and cold Arctic air. This jet stream is the force that is responsible for the fast movement of the storms across the United States.

Science News Letter, December 29, 1951

MEDICINE

Greater Cold Risk If Children Are Under 10

➤ PARENTS OF children under 10 years old run a greater risk of getting colds, sore throats and the other respiratory diseases than parents of older children.

This has long been suspected by parents and now it is presented as a fact established through studies of 1,000 families in Pleasantville and Mt. Kisco, Westchester County, N. Y. The studies were made by Miss Jane E. Coulter and Miss Doris Tucker of the Milbank Memorial Fund in New York.

Fathers having only children under 10 had from 17% to 88% more colds, sore throats, etc., than fathers of children aged 10 to 18. Mothers of the young children had 36% to 61% more colds and respiratory illness than mothers of older children.

Science News Letter, December 29, 1951

TECHNOLOGY

Colored Lights Help to Sort Fruits and Vegetables

➤ BETTER QUALITY fruits and vegetables are foreseen through the use of colored lights in sorting defective food from good material.

G. M. Peterson and W. M. Carleton of Michigan State College's Agricultural Experiment Station, East Lansing, find that the problem of spotting small defects is much simpler when background and lighting colors are carefully chosen.

Besides changing the lighting color, they suggest that inspection belts be given the right color either by making the rubber the required shade or by using a transparent belt with the right color placed underneath. Rubber conveyor belts can not be painted because of sanitary reasons.

This new approach to detecting small but important defects in fruits and vegetables increased the efficiency of workers as much as 64%, their recently completed tests with cherries in 13 Michigan processing plants showed.

Science News Letter, December 29, 1951

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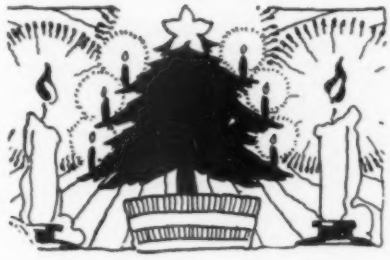
ETHNOLOGY

NATURE RAMBLINGS



The New Year

➤ NEW YEAR'S Day is not the same on all calendars. Many peoples reckoned the year as beginning in the spring—ancient Greeks and Romans, for example—and a few even in autumn.

But the marking of the new year has always been tied up with one of the four principal points of the sun's apparent path through the heavens: spring and autumn equinoxes, when days and nights are equal in length; summer solstice, when days are longest; and winter solstice, when they are shortest.

It is quite natural to begin the year in spring, when the days have grown long enough to provide warmth and light for germinating seeds and opening buds on vines and fruit trees. Calendars that put New Year's Day on or near the spring equinox are farmers' calendars.

It is not without significance that Mars, in whose month (March) the Romans celebrated the coming of their new year, was the god of agriculture as well as the god of war.

It may seem strange, if you stop to think of it, that the calendar of the Christian year, which has come to be that of all Western civilization, should begin when nights are still long and dark, and when the coldest weeks of winter are still to come.

But the long nights are not quite so long as they were a short time before. The winter solstice has been passed; the sun's retreat southward has turned into an advance northward again.

It was this first token of new hope that was the occasion of the old pagan Yuletide feast, with its brave show of evergreen branches, holly, mistletoe and all the other trappings that have been taken over bodily by ourselves, including the immemorial, somewhat irrational, but thoroughly human, custom of showing how glad we are by eating (and perhaps drinking) too much.

There is no written record of the exact date of Jesus' birth, as there is in all the gospels of his crucifixion. We have a hint that it may well have been in winter, because of the anxious need for shelter that sent Joseph and Mary into a stable when there was no room for them in the caravanserai.

In selecting this particular time to celebrate the birth of Christ, and his ceremonial acceptance into the Jewish community a week later, the early Church simply took over the ancient pagan feast of hope and gave it a new significance.

Science News Letter, December 29, 1951

CHEMISTRY

Develop Single-Treatment Fungicide for Tomatoes

➤ A SINGLE treatment for tomato plants with a newly developed fungicide will prove effective against all major fungus enemies, to both fruit and foliage, it has been announced by the Du Pont Company, Wilmington, Del. The same fungicide is recommended for potatoes and may later, after extensive tests have been made, be recommended for many other crops.

Manzate fungicide is the name adopted for the new spraying material. Chemically it is based on derivatives of dithiocarbamic acid and its technical name is manganese ethylene bisdithiocarbamate. It has already undergone extensive field tests carried out in 32 states, Canada and Mexico, to evaluate the compound for disease control for many vegetables and also for apples, tobacco, melons and nuts.

A great advantage of the new fungicide in addition to its effectiveness is that it alone gives protection against all fungous diseases on tomatoes. Previously two or more chemicals have been required in alternate applications to control the various diseases. It is particularly recommended to control anthracnose, gray leaf spot and Septoria leaf spot on tomatoes, and early and late blights on both tomatoes and potatoes.

Science News Letter, December 29, 1951

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AGRICULTURE

Wind Machines Plus Heaters To Fight Frost Off Fruit

See Front Cover

➤ WIND MACHINES plus orchard heaters provide the best frost protection at the least cost for southern California's citrus groves, four agricultural engineers in that state have found.

To beat the icy crop killer, they recommend taking advantage of the earth's atmosphere as a heat source, drawing the warm upper air down to the ground. Temperatures 30 to 40 feet above the ground are often from five to ten degrees warmer than those within a few feet of the soil. Wind machines whip this warmer air down to the ground, literally putting the heat on Jack Frost, the most effective protection method.

The cost of operating wind machines with eight to 15 heaters per acre was only 67 cents per acre hour in tests they ran at the University of California's College of Agriculture at Davis. When used alone, 25 to 50 heaters are required for the same amount of protection. Cost for the heaters would be $3.60 per acre hour, Drs. F. A. Brooks, C. F. Kelly, D. G. Rhoades and H. B. Schultz have calculated.

They placed their machines about 600 to 800 feet apart in the orchards. The slowly rotating towers bring a blast of air to a given direction every four or five minutes. The propellers are 32 feet above the ground and directed slightly downward to give air gusts penetrating the orchard about 80 feet away.

Science News Letter, December 29, 1951

Vegetable oils may become more important than petroleum in the economy of the Southwest; they come from crops which are renewable each year while petroleum comes from a source than can not be replenished.

Mechanical pickers are now in use gathering snap *beans*.

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ERRATA, Vol. 60, Nos. 1-26, July-December, 1951

PAGE	TITLE BEGINS	CORRECTION
63	Do You Know	Line 6, *after* the *insert* soup fin; line 8, A *for* D.
69	New Theory	Par. 2, line 7, Niels *for* Neil.
76	Snails	Col. 2, par. 3, lines 10-11, *delete* a snail . . . anomaly; *insert after* habitats, "some species, however, are found on the desert."
85	Plants Made Poisonous	Par. 4, 8, 9, 15 and 16, *read* phosphonous *for* phosphonus; last par., phosphonous acid (British usage) is $H_2P(\rightarrow O)OH$, phosphinic acid (American usage).
86	Time Differences	Col. 3, lines 6-10, *read*, Twenty-two hours after the day began, it reaches the Hawaiian Islands, at 6:00 a.m. EDT. Two hours after that the midnight meridian . . . *Delete* last two sentences of article.
87	First Tree Felled	Sub-title. line 2, 9,000 *for* 7,000.
107	Salmon May Smell	Par. 3, line 9, *read*, University of Wisconsin report. *Delete* lines 10-11.
107	Puncture-Proof Tire	Line 5, 2,563,466 *for* 2,563,446.
124	2,000,000 Filters	Par. 3, lines 7-8, *read* one long tube, . . . ureter,
137	Magnetic Fluid	Line 6, W. *for* B.
162	Cold spray	Par. 4, *Delete* last sentence.
216	Week-Old Babies	Par. 2, line 3, *insert after* have, already.
242	More Protein	Par. 1, line 2, protein quality *for* protein content.
278	Find Cure for	Par. 2, *Read* In some climates the tendency for conductors to dance may require use of otherwise unnecessarily wide spacing, J. E. Sproule. . . .
327	Red Blood Cells	Col. 3, lines 4-5, Ciencia e Investigacion (Buenos Aires) April *for* Science and Investigation (April)

CHEMISTRY

Chemical for Elm Disease

➤ DUTCH ELM disease, which once threatened doom to the popular shade tree, can be prevented in seedlings in all but a few cases by a newly developed chemical treatment.

Dr. A. E. Dimond, chief plant pathologist of the Connecticut Agricultural Experiment Station at New Haven, reported that the chemical, 2-methylcarboxymercaptobenzothiazole, has given better results against the dread disease than any other method now being used.

The compound acts from the inside of the tree, being absorbed by the elm to attack the disease-causing fungus at its source. It can, however, be sprayed on the tree, a method much less cumbersome and expensive than applying a compound to the soil under pressure as is required for the two chemicals previously most effective against the disease. Many city trees cannot receive soil treatments because they are surrounded by pavement.

Seedling elms treated with the new chemical and then inoculated with the Dutch elm disease fungus showed only five per cent disease at the end of the season. Untreated elms inoculated in the same way were 45% diseased at the end of the same period, while those treated with one of the previously most effective chemicals were 12% diseased.

The compound is not yet on the market and still has to pass a few more seasons of extensive testing, Dr. Dimond told the American Phytopathological Society meeting in Cincinnati, Ohio.

Since introduced into this country in 1930, the Dutch elm disease has destroyed thousands of priceless elms. It has spread as far west as Colorado and as far south as Virginia.

Besides the chemical treatment of the tree from the inside out, known as chemotherapy, scientists battle to save the elm by halting the insects that spread the Dutch elm disease and another serious threat to the shade tree, phloem necrosis. To fight the insects carrying the twin blights, high-pressure, high-dosage DDT sprays are used. When the blast of chemical mist is enough to soak completely the foliage of a tree, the job of protection is about 40% done, scientists have found.

One hope for the future are strains of disease-resistant elms being studied by the U. S. Department of Agriculture. But worried scientists are concentrating on ways to save the present generation of elms, as a new generation may come too late.

Science News Letter, December 29, 1951

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AMERICAN CRETACEOUS INSECTIVORES—George Gaylord Simpson—*American Museum of Natural History*, 19 p., illus., paper, 25 cents. Increased knowledge and reconsideration of data in the last 20 years have led to some changes in earlier thinking about late Cretaceous mammals in North America; there were probably more, and more varied, insectivores among them than has been previously supposed.

COMMUNITY HEALTH EDUCATOR'S COMPENDIUM OF KNOWLEDGE—Clair E. Turner—*C. V. Mosby Co.*, 266 p., illus., $3.00. Intended to provide the teacher or prospective teacher of public health at any level with a quick check of the validity of his goals and the usefulness of his methods.

GENERAL ASTRONOMY—Harold Spencer Jones—*Arnold, E. & Co.* (Longmans), 3rd ed., 456 p., illus., $5.75. Revision of this textbook has brought it up to date with respect to observations and hypotheses growing out of observations; there are four new plates from Mt. Wilson and Palomar.

HIGHER CHEMICAL ARITHMETIC—F. W. Goddard—*Longmans*, 221 p., $1.60. Summaries of the mathematical principles and methods used in chemistry, examples of typical problems with explanations, and over 400 problems. Answers at back.

HUMAN DIGNITY—Don G. Mitchell—*Industrial Hygiene Foundation*, 9 p., paper, free upon request to publisher, Mellon Institute, 4400 Fifth Ave., Pittsburgh 13, Pa. A paper delivered at the annual meeting in November.

INDIANA SCIENTISTS: A Biographical Directory and an Analysis—Stephen Sargent Visher—*Indiana Academy of Science*, 286 p., $2.50. A study of the conditions leading to the production of superior men.

NEW BIOLOGY 11—M. L. Johnson and Michael Abercrombie, Eds.—*Penguin*, 123 p., illus., paper, 50 cents. Articles by biologists on the banana, adaptation problems, biological activities of molecules, aphids and plant growth, photosynthesis, accident proneness and *Paramecium*.

A NEW GENUS AND NEW SPECIES OF ASELLOTE ISOPOD, *Caecijaera Horvathi*, FROM LOS ANGELES-LONG BEACH HARBOR—Robert James Menzies—*American Museum of Natural History*, 7 p., illus., 25 cents. Remarkable for several reasons, this species has been collected only in association with *Limnoria*.

PANORAMA OF SCIENCE, 1951: Annual Supplement to the Smithsonian Series—Webster Prentiss True, Ed.—*The Series Publishers, Inc.*, 416 p., illus., $5.50. Articles from scientific and technical journals, selected for their broad implications, topical interest and readability by the layman.

PHYSICAL PROPERTIES AND ANALYSIS OF HEAVY WATER—Isidor Kirshenbaum—*McGraw*, 438 p., illus., $5.25. One of the National Nuclear Energy Series, prepared as a record of the research work done under the Manhattan Project and the Atomic Energy Commission.

PRODUCTIVITY, SUPERVISION AND MORALE AMONG RAILROAD WORKERS—Daniel Katz and others—*Survey Research Center*, 61 p., $1.50. As in an earlier study of clerical workers, the evidence seems to be that there are basic differences between the successful and the unsuccessful supervisor in terms of his awareness of interpersonal relations, rather than in his use of "magic gestures or 'human relations tricks'."

REPORT OF THE SCIENTIFIC DIRECTOR: June 30, 1951—*The Nutrition Foundation, Inc.*, 59 p., illus., paper, free upon request to publisher, Chrysler Building, New York 17, N. Y. Research work supported by the Foundation is bearing fruit in attitudes toward disease and health.

SCIENCE NEWS 22—A. W. Haslett, Ed.— *Penguin*, 128 p., illus., paper, 50 cents. Articles by scientists on hurricanes, pictures in the mind, acceleration of charged particles, the Assam earthquake, color, muscle activity patterns, photosynthesis and other research.

THE STRUCTURE OF THE GALAXY—*University of Michigan Press*, 84 p., illus., paper, $2.50. Papers presented at the dedication of the Heber Doust Curtis Memorial Telescope.

STUDIES OF PERUVIAN BIRDS, No. 61: The Genera *Aglaeactis, Lafresnaya, Pterophanes, Boissonneaua, Heliangelus, Eriocnemis, Haplophaedia, Ocreatus*, and *Leshia*—John T. Zimmer—*American Museum of Natural History*, 55 p., 25 cents.

WET LABORATORIES—E. Laurence Palmer—*New York State College of Agriculture*, Cornell Rural School Leaflet Vol. 45, No. 2, 32 p., illus., paper, 10 cents. Another in the "laboratory" series showing that it is not necessary to travel to find examples of natural phenomena worth studying, this leaflet relates roofs, rainspouts and puddles to watersheds, power sources and pollution.

Science News Letter, December 29, 1951

INVENTION

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► TYPISTS MAY well thank inventor James G. Allemann, Santa Ana, Calif., for patent 2,571,996, suggesting a bell that rings when the paper in the typewriter reaches a prescribed distance from the bottom of the page.

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⚙ *LACING SHOE is a toy for the youngster with which he learns how to lace and unlace his own footwear. This toy, in bright colors, contains "the old woman who lived in a shoe" and a number of little wooden people. The laces are easily handled by little fingers.*

Science News Letter, December 29, 1951

⚙ *MATCHBOX-COMPASS-WHISTLE combination is a device for the sportsman lost in the woods. The plastic tubular case is waterproof, the compass is at one end, and the shrill whistle at the other. The compass unscrews, enabling the matches to be reached.*

Science News Letter, December 29, 1951

⚙ *MECHANIC'S SUPPORT, recently patented device to elevate the automobile repairman and enable him to reach equipment under the hood, is a shelf attachable to the tire of the vehicle by means of two hooked arms that extend over the wheel top. It is adjustable and particularly suited for work on trucks.*

Science News Letter, December 29, 1951

⚙ *EYEGLASSES for television fans permit all-evening viewing without discomfort from TV glare to the eyes. These glasses, not designed to correct visual defects, prevent eye weariness and provide softer, more human pictures, even when sets are turned up bright.*

Science News Letter, December 29, 1951

⚙ *PROTECTIVE ENCLOSURE, for use in laboratories to prevent danger from explosive action, is shown in the photograph. It is designed particularly for use with small vacuum desiccators in which drying is aided by vacuum. The upper part of the aluminum holder is perforated to relieve pressure; the lower part has a solid surface to catch spilled chemicals.*

Science News Letter, December 29, 1951

⚙ *ADDING MACHINE, pocket-sized for use in the field or office, is a precision-made device in a flat aluminum case which has four selector dials operated by a stylus. It provides a handy check for computations up to four digits.*

Science News Letter, December 29, 1951

⚙ *JAR OPENER, for the kitchen, is a small device to fasten to the underside of a cupboard or a pantry shelf. It has an adjustable gripping mechanism so that it can be used with all types of jars, glasses, bottles and pry-off tops. It can be used also for sealing jars.*

Science News Letter, December 29, 1951

⚙ *HOT-OR-COLD pack, to apply heat or cold to the human body, is made of a transparent durable plastic and has four separated compartments each filled permanently with a special chemical solution. To heat, the pack is placed in hot or boiling water. To chill, it is put in the refrigerator.*

Science News Letter, December 29, 1951

Do You Know?

The waste of *raw materials* in wood manufacturing industries is probably greater than in any other industry.

The *tung* tree, source of tung oil for paints, was introduced into Florida about 25 years ago, but American tung growing now centers in coastal areas of Mississippi and Louisiana.

Natural gas is odorless; the gas delivered to homes contains a special odorant for safety's sake.

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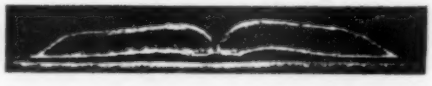

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